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## Japanese Utility Model Laid-Open

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Title of the Invention: VEHICULAR REAR VIEW DEVICE

Application No. 58-27927

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## SPECIFICATION

### 1. Title of the Invention

VEHICULAR REAR VIEW DEVICE

### 2. Claim

A vehicular rear view device comprising: an inter-vehicle distance radar unit mounted on a vehicle for detecting a following vehicle position with radar means of ultrasonic waves or electric waves; and a vehicle-mounted imaging unit mounted on the vehicle for imaging the situation of a following vehicle with a TV camera on a display unit arranged near a driver's seat, characterized in that said vehicle-mounted imaging unit is driven with the detection output of said inter-vehicle distance radar unit to image on said display unit when the following vehicle approaches within a predetermined distance range.

### 3. Detailed Description of the Invention

#### Technical Field

This invention relates to a rear view device for a vehicle and, more particularly, to a vehicle-mounted image device for displaying the image of an approaching vehicle on a display unit arranged in the vehicle, by using a TV camera.

#### Background Art

Generally, it is very important for securing safety to confirm the situation of a following vehicle while an automobile is running. Especially on a free way, the vehicles are running at high speeds, and the rear has to be always confirmed at the time of passing another car ahead. In the prior art, this confirmation of the following car has been done through the side mirrors and the back mirror arranged on the front portion of the vehicle. Another car is difficult to confirm when it comes into the dead angle. Then, the driver often breaks the drive position at each time to confirm the rear thereby to raise major causes for a rear-end collision or a contact accident. In recent years, therefore, there has been proposed either an inter-vehicle distance radar device, in which a radar unit of ultrasonic waves, electric waves or light is attached to the back of a vehicle body so as to detect the approaching situation of the following car and to inform the driver of it, or a vehicle-mounted imaging device, in which a TV camera is arranged in the back portion of the vehicle so as to project the image

on a monitor TV arranged at the driver's seat.

However, the former radar device can confirm the approaching situation of the following vehicle to some extent with the voice, but is defective in that it is hard to observe the position and direction of the vehicle reliably. On the other hand, the latter vehicle-mounted imaging device can view the projected image to eliminate the aforementioned defect. The latter device is acceptable in case the image is always gazed at, but is defective in that the attention cannot be continued to mistake the situation with an interrupted view. Thus, the vehicular rear view device of the prior art reports the driver the situation of the following vehicle with the voice or the view, but is still insufficient for the effect.

#### Disclosure of the Invention

Therefore, the present invention have been proposed in view of the description thus far described and has an object to provide a vehicular rear view device for an automobile, which can catch the approach of a following vehicle reliably with a radar unit and can project the approaching situation on a vehicle-mounted display unit at an emergency at a vehicle approaching time thereby to inform the driver of the situation.

Specifically, the vehicular rear view device according to the present invention is configured to include an inter-vehicle distance radar unit for confirming a following vehicle with electric waves or the like, and a vehicle-mounted

imaging unit including a TV camera for projecting the image of the following vehicle. In case the following vehicle approaches into a predetermined range, it is detected by the radar device. Only at this detection, the vehicle-mounted imaging unit is driven to project the approaching situation to arise the driver's attention. Therefore, the driver need not gaze at the display unit at all times to observe the rear view, but can properly cope with an emergency of vehicle approach, as experienced by passing the following vehicle ahead, by observing the rear image projected. Moreover, the aforementioned TV camera and display unit can be interlocked with not only the aforementioned radar unit but also a manual changeover or winker switch. Thus, it is possible to provide a vehicular rear view device which is excellent in the driving operation.

#### Best Mode for Carrying out the Invention

An embodiment of the present invention will be described in detail with reference to the drawings.

Fig. 1 and Fig. 2 each are a perspective view and a block circuit diagram of Fig.1 showing one example of a vehicle rear view device according to the present invention. In the drawing, numeral 1 designates a well-known inter-vehicle distance radar unit arranged at a vehicular back portion for monitoring an outside object with laser means of electric waves or sound waves; numeral 2 designates a CRT display unit arranged on the dash

board face near the driver's seat in a compartment; and numeral 3 designates a TV camera arranged backward at the back portion in the compartment and driven by an instruction of the aforementioned inter-vehicle distance radar device 1 for projecting a rear image on the CRT display unit 2. Moreover, numeral 4 designates a voice generation unit driven by an instruction of the aforementioned inter-vehicle distance radar unit 1 like the aforementioned TV camera for generating a predetermined voice.

More specifically, the inter-vehicle distance radar unit 1 is configured, as shown in the block circuit diagram of Fig. 2, to include an ultrasonic pulse generation unit 5, an ultrasonic wave transceiver 6 using an ultrasonic oscillator, a range calculation unit 7, and a comparator 9 for comparing the calculated output from the range calculation unit 7 with a reference value of a range setting unit 8. In the inter-vehicle distance radar unit 1 used, the ultrasonic waves oscillated from a transmission unit 6a are reflected on an outside object such as a following vehicle, and the reflected waves are received by a reception unit 6b, so that their time discrepancy is calculated by the range calculation unit 7. The output signal of this range calculation unit 7 is inputted to the comparator 9, in which it is compared with the reference signal from the range setting unit 8. A control unit 10 is driven when the outside object approaches more than a predetermined distance.

Moreover, the control unit 10 drives the voice generation unit 4 and the TV camera 3 so that the image of the TV camera 3 is projected by switching the image of the CRT display unit 2. The voice generation unit 4 can be exemplified by combining a microphone and a speaker to collect and broadcast the engine sound of an outside vehicle loudly, or to broadcast "Vehicle is approaching" or "Pay attention to the following car", for example, in the recorded sound which has been stored by using a voice synthesizing unit.

Numerals 11 designates a manual changeover unit 11 connected with the control unit 10. This manual changeover unit 11 is interlocked with a winker SW, for example, for projecting the image of the TV camera at the time of turning the wheel to the right or left.

According to this configuration, the inter-vehicle distance radar unit 1 monitors the rear at all times. When the following car approaches into the predetermined range set by the range setting unit 8, the voice generation unit 4 is driven to inform the driver of the approach, and the control unit 10 is activated to project the image by the TV camera 3 on the CRT display unit 2. As a result, the driver need not note the outside image by the TV camera 3 at all times but is warned, only when the radar unit detects, with the outside image of the display unit activated by the TV camera. It is, therefore, possible to prevent an accident due to a mistaken recognition.

#### 4. Brief Description of the Drawing

Fig. 1 is a perspective view of a vehicular rear view device according to the present invention, and Fig. 2 is a block circuit diagram of Fig. 1.

1 ... Inter-Vehicle Distance Radar Unit, 2 ... Display Unit,  
3 ... TV Camera.

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#### [FIG. 2]

- 2 CRT DISPLAY UNIT
- 3 TV CAMERA
- 4 VOICE GENERATION UNIT
- 5 ULTRASONIC PULSE GENERATION UNIT
- 6 ULTRASONIC WAVE TRANSCEIVER
- 7 RANGE CALCULATION UNIT
- 8 RANGE SETTING UNIT
- 9 COMPARATOR
- 10 CONTROL UNIT
- 11 MANUAL CHANGEOVER UNIT INTERLOCKED WITH  
WINKER SW

⑨ 日本国特許庁 (JP)

⑩ 実用新案出願公開

⑫ 公開実用新案公報 (U)

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審査請求 未請求

(全 2 頁)

⑭ 車輛後視装置

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⑦ 考 案 者 星野太郎

⑮ 実用新案登録請求の範囲

車輛に搭載され超音波や電波等のレーダ手段で後続車輛位置を検出する車間距離レーダ装置と、車輛に搭載されTVカメラで後続車の状況を運転席近傍に配置したディスプレイ装置に映像する車載映像装置とで構成し、前記車間距離レーダ装置の検出出力で前記車載映像装置を駆動させ後続車輛が所定距離範囲内に接近して来たとき前記デ

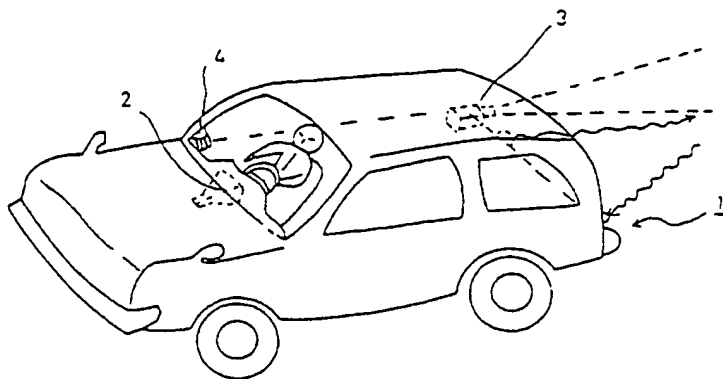
スプレイ装置に映像するようにしたことを特徴とする車輛後視装置。

図面の簡単な説明

第1図は本考案に係る車輛後視装置の斜視図、第2図は第1図のブロック回路図である。

1…車間距離レーダ装置、2…ディスプレイ装置、3…TVカメラ。

第1図





第2図

